where ρ is the density of the fluid, g is the acceleration of gravity, and his the height difference between the upper and lower fluid surfaces and P_v is the internal venous pressure. For a 1 m head height the total pressure is therefore at least 8800 Pa. The internal pressure is not negligible but is a small fraction of the head height pressure under normal operating conditions.

I claim:

1. A medical infusion device for controlling the flow rate of a fluid into a patient's body, comprising:

a tube for carrying fluid from a proximal end to a distal end thereof under the action of a driving pressure, which tube is flexible or has a flexible segment at some point along its length;

a clamping element capable of preventing fluid flow by fully occluding a portion of said flexible tube or said flexible segment;

a movable pusher element for acting variably against said clamping element to variably reduce said occlusion of the clamped portion of said flexible tube or flexible segment and thereby provide a controlled rate of fluid flow;

two independently controllable electromechanically controlled actuator elements capable of moving variably over a prescribed range; and

a mechanical linkage among said actuator elements, said pusher element and said clamping element, configured such that the motion of said actuator elements is transmitted to said pusher element which in turn is transmitted to said clamping element for varying said occlusion and thereby varying said rate of fluid flow; wherein:

the motion of said pusher element is a function of the motions of said actuator elements; and

the force applied by the pusher element is a function of the force applied by said actuator elements.

2. The device of claim **1**, said mechanical linkage comprising:

a coupling arm with two end points thereof;

each of said two independently controllable actuator elements situated adjacent and configured to act upon and move, a respective one of said coupling arm end points;

said pusher element situated adjacent and configured to act upon and move, an intermediate point of said coupling arm, wherein:

said motion of said pusher element is a function that is a weighted average of the movements of said actuator elements, as determined by the relative lengths of the two portions of said coupling arm between said intermediate point and said end points; and

force applied by said pusher element is a function that is a weighted sum of the force applied by said actuator elements, as determined by the relative lengths of the two portions of said coupling arm between said intermediate point and said end points.

3. The device of claim **2**, each said actuator element comprising a motor for acting directly or through a gear reducer to rotate a cam, wherein:

said cam contacts a cam follower or fixed surface at one of said end points of said coupling arm to produce movement of said end point of said coupling arm.

4. The device of claim **1**, each actuator element comprising a bellows or cylinder for extending under controlled pneumatic or hydraulic pressure, and retracting when no pressure is applied by the action of a return spring.

5. The device of claim **1**, further comprising two independent electronic actuator controllers, each independently controlling one of said two independently controllable electromechanically controlled actuator elements; configured wherein:

a failure of one of said actuator controllers does not affect the operation of the other actuator controller and its associated actuator; and

each of said actuator controllers receives status signals from other elements of a flow control device, including the other actuator controller and a master controller, and can independently respond to signals indicating error or failure conditions occurring in said other elements.

6. The device of claim **1**, wherein:

said actuator elements, said pusher element, and said mechanical linkage are configured such that:

both actuators must move a prescribed distance to cause movement of said pusher element sufficiently so as to enable fluid flow; and

either of said actuator elements is configured such that it can be moved to a particular position which will in turn move said pusher element into a disposition that fully occludes fluid flow, independent of the movement or position of the other of said actuator elements.

7. The device of claim **1**, further comprising a drip chamber and a flow rate monitoring system, said flow rate monitoring system comprising:

at least one optical imager directed toward areas and fluid flow features within said drip chamber;

at least one illuminator for directing illumination toward features within said drip chamber to which said optical imagers are directed;

a user interface, computerized or electronic processing, and non-transient computerized storage capable of performing processing and analysis operations and extracting feature information from digital images obtained by said optical imagers; and

said computerized or electronic processing further capable of analyzing and obtaining metrics from said feature information.

8. The device of claim **7**, said fluid flow features within said drip chamber selected from the fluid flow features group consisting of: fluid entering said drip chamber at a nozzle of said chamber during use; pendant fluid drops in area below said nozzle where pendant fluid drops form during use; and a fluid pool in lower section of said drip chamber formed during use.

9. The device of claim **7**, said metrics for said drip chamber selected from the metric group consisting of: drop rate; fluid pool depth; fluid type; pendant drop volume; error conditions; label data; and tag data.

10. The device of claim **7**, wherein growth of pendant drops is monitored as a means for measuring flow rate in sub-drop increments and further comprising:

said fluid flow features comprising pendant fluid drops in area below said nozzle where pendant fluid drops form during use;

said at least one optical imager and said at least one illuminator configured such that a distinct specular highlight appears in images obtained with said optical